

CA2ALLF 75

71 576

C.2

ALBERTA LEGISLATURE LIBRARY



3 3398 00205 9524

SURFACE RECLAMATION
AND ITS
APPLICATION TO COAL MINING

Task Force Report

LIBRARY
VAULT 19

Digitized by the Internet Archive
in 2022 with funding from
Legislative Assembly of Alberta - Alberta Legislature Library

MEMBERS OF THE TASK FORCE

1. H. W. Threlkoff (Chairman) - Interdepartmental Planning Division
2. J. A. MacIsaac (Vice-Chairman) - Water Resources Division
Land Development Branch
3. M. B. Thompson (Secretary) - Water Resources Division
Land Development Branch

SURFACE RECLAMATION
AND ITS
APPLICATION TO COAL MINING
Task Force Report

4. J. MacIsaac - Land Development Branch
5. J. MacIsaac - Land Development Branch
6. J. MacIsaac - Land Development Branch
7. J. MacIsaac - Land Development Branch
8. J. MacIsaac - Land Development Branch
9. J. MacIsaac - Land Development Branch
10. J. MacIsaac - Land Development Branch
11. J. MacIsaac - Land Development Branch
12. J. MacIsaac - Land Development Branch
13. J. MacIsaac - Land Development Branch
14. J. MacIsaac - Land Development Branch

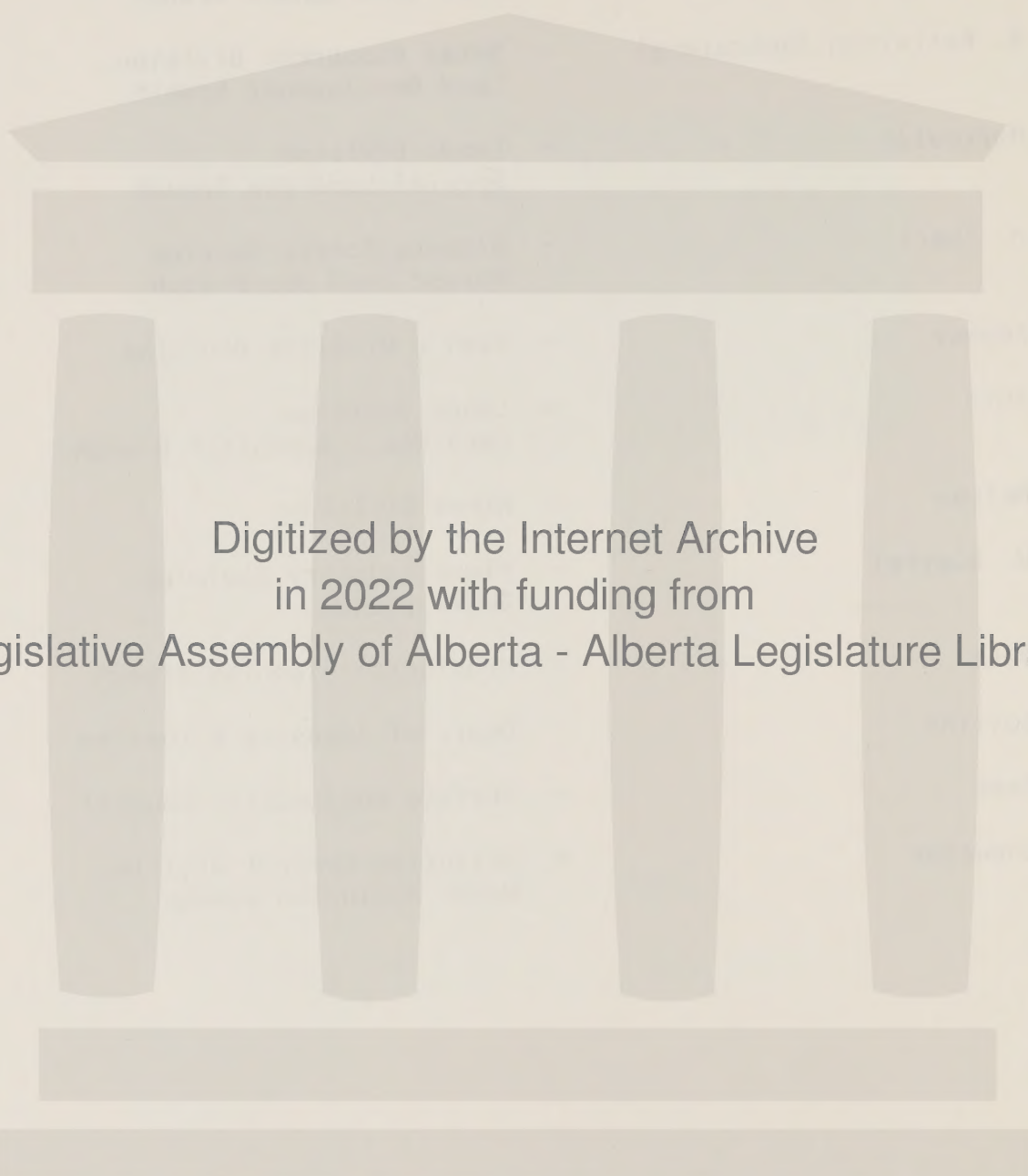
Prepared For The
Conservation and Utilization Committee

NOV 5 1971
October, 1971.

Edmonton, Alberta

MEMBERS OF THE TASK FORCE

1. H. W. Thiessen (Chairman) - Interdepartmental Planning Division
2. D. G. Harrington (Vice-Chairman)- Water Resources Division
Land Development Branch
3. D. B. Patterson (Secretary) - Water Resources Division
Land Development Branch
4. J. Markovich - Lands Division
Special Land Use Branch
5. G. M. Smart - Alberta Forest Service
Forest Land Use Branch
6. B. Kemper - Fish & Wildlife Division
7. L. Yule - Lands Division
Land Use & Appraisal Branch
8. P. Melson - Mines Division
9. A. W. Goettel - Plant Industry Division
Soils Branch
10. N. Dant - Provincial Planning Branch
11. L. Collins - Dept. of Industry & Tourism
12. D. Rees - Surface Reclamation Council
13. P. Shewchuk - Pollution Control Division
Water Pollution Branch



Digitized by the Internet Archive
in 2022 with funding from
Legislative Assembly of Alberta - Alberta Legislature Library

TABLE OF CONTENTS

	<u>PAGE</u>
INTRODUCTION	1
PHILOSOPHY	2
LEGISLATIVE AUTHORITY	5
RECOMMENDATIONS	5
COAL MINING EXPLORATION, OPERATION AND RECLAMATION REGULATIONS	
a) Application for Coal Mineral Leases	8
b) Application for Exploration	8
c) Application for Development	11
d) Review of Development and Reclamation Plan	23
e) Development and Reclamation Plan Guidelines	24
f) Inspection and Reporting Responsibilities	28
APPENDIX 1	
LAND CONSERVATION GUIDELINES	31
APPENDIX 2	
ACTIVITY FLOW CHART	41

1. INTRODUCTION

A. Purpose of Study

The apparent foreign and domestic demand for Alberta coal is accelerating exploration and development, especially in the foothills and mountain regions. This activity will result in more surface mines which have a far greater environmental impact than sub surface mines. These developments, in conjunction with society's increasing awareness and concern for environmental maintenance and protection, prompted the government to direct the Conservation and Utilization Committee to prepare a task force report leading to administrative policy, regulations, guidelines and program procedures which would result in the minimization and control of environmental degradation and still permit the necessary development of these energy resources.

B. Terms of Reference

An interdisciplinary task force consisting of various staff members responsible for the administration of those resources, on which coal development impinges, from numerous departments was established. It was charged with the following basic responsibilities within the framework of the study purpose stated earlier.

- (1) Develop specific content for incorporation in provincial regulations.
- (2) Develop those criteria which were of a less specific nature and were better described as guidelines to the administrative decision making process.
- (3) Develop the necessary functional activity procedures and sequence from an administratively neutral viewpoint that

would emphasize the rational objective of the program purpose rather than institutionalize administrative agency procedures.

The task force has addressed itself to these responsibilities, and found in so doing, the need to enunciate a philosophical rationale for its recommendations in order that they be considered in context with the past several months of discussion and simultaneous problem application. It has also discussed some of the intricacies of integrating the proposed regulations with current regulatory procedures and administrative responsibilities.

2. PHILOSOPHY

Implementation of The Surface Reclamation Act in 1963 was a major thrust forward in environmental rehabilitation on all surveyed lands within the Province not constituted as a forest reserve under The Forest Reserves Act. Subsequent amendment to The Public Lands Act in 1969 provided a similar degree of rehabilitation with increased emphasis to all public (Crown) lands to which The Surface Reclamation Act did not apply although the administrative mechanism was dissimilar to the Surface Reclamation Council as a result of all public ownership and the non-existence of a local authority. Both statutes, however, in the context of surface coal mining (The Surface Reclamation Act, Ch. 356 R.S.A. 1970, Sec. 4(c) and The Public Lands Act, Ch. 297, R.S.A. 1970, Sec. 11 (1) (c)) are legally operative in "the conditioning, maintenance and reclamation of the surface of the land (public lands)" which implies remedial action after the surface disturbance has transpired.

In actual administrative procedure public lands are provided a greater degree of preventive environmental management since the Crown, being the rightful surface owner and also having a variety of capable expertise at its disposal, can negotiate the terms of entry, exploration, development and reclamation as a condition of surface lease provided that The Right of Entry Arbitration Act is not brought to bear on the negotiations. A patented land holder does not enjoy a similar degree of preventive protection.

The task force took the position that in order to permit and provide for the orderly development of the sub surface coal resources in relation to the effective environmental conservation and efficient utilization of the surface renewable resources to meet the economic needs and social wants expressed by society, a greater emphasis must be placed on preventing environmental degradation. This statement applies to all facets of exploration, extraction, processing and transfer of the resource in order that unnecessary disturbances are prevented and necessary disturbances are minimized. The key factor is comprehensive environmental planning.

Comprehensive environmental planning must be multi-disciplinary. It must reflect the technology of those who manage the resources as well as those who use the resources. In government, it must be interdepartmental in composition, crossing departmental interfaces at numerous levels with a minimum of administrative confusion and jurisdictional conflict. The planning process must be program oriented with the realization that each component can make a positive contribution but that all contributions are required to achieve the objective. This process must be implemented prior to

three specific events in order that environmental controls are possible;

- (1) prior to the proposed sale or renewal of the mineral lease, in order to predetermine the potential environmental degradation;
- (2) prior to the issue of the necessary exploration permit in order that the terms and conditions for exploration and reclamation are defined;
- (3) prior to the approval to proceed with the mining development in order that all factors of development and reclamation, including subsequent surface land use are satisfactorily agreed to.

Most of the criteria used to assess a mining proposal are relative. They are a function of location, topography, vegetation, depth of mineral deposit, competing or conflicting land uses, etc. It is virtually impossible to define meaningful standards which would apply equally well to the prairie strip mines, the foothills strip mines and the mountain strip mines. The principles on which each individual site would be assessed are, however, common. For this reason the task force was of the opinion that individual site planning relying on collective judgements was a more effective means of control than the rote application of regulations.

Finally the task force saw the need to apply the recommendations of this report to all lands within Alberta, patented or public, surveyed or unsurveyed, regardless of their geographic location in order that consistent preventive action would apply. The sequential application of these recommendations could be:

- (1) comprehensive adoption by all future applications for surface disturbances relative to coal mining,

- (2) rational negotiation for as complete adoption as is feasible within economic and legal limits on existing operations,
- (3) subsequent application to terminated operations. The question of surface ownership and financial responsibility would be subject to negotiation.

3. LEGISLATIVE AUTHORITY

The question of which legislative authority the regulations should be passed under was discussed. Both The Surface Reclamation Act and Section 11 of The Public Lands Act had inherent limitations which could not accommodate the intent of the regulations, guidelines or functional activity procedures.

The Department of The Environment Act does appear to provide the necessary legislative authority to encompass the intent of the regulations to permit comprehensive environmental planning, "stop order" authority to effectively cease operations and to provide for adequate penalties of up to \$10,000. for each day that the offence continues. For these reasons, the regulations are drafted under The Department of The Environment Act.

The regulations and functional activities procedures network are purposely neutral on the subject of administrative departments or agency. This was a specified condition of the study. It is trusted that the Natural Resources Co-ordinating Council and Executive Council will resolve this problem with recommendations from the Conservation and Utilization Committee.

4. RECOMMENDATIONS

- (1) The task force recommends the intent of the draft regulations with the full recognition that considerable legislative drafting

is required to adequately express the full intent as well as inter-relate the draft with allied statutes and regulations including The Surface Reclamation Act, The Public Lands Act, The Forests Act, 1971, The Forest and Prairie Protection Act, The Clean Water Act, The Clean Air Act, The Hydro and Electric Energy Act, The Planning Act, The Municipal Government Act, The Mines and Minerals Act, The Coal Mines Regulations Act, The Water Resources Act and the various regulations thereunder.

- (2) The task force recommends the intent of the guidelines specified in sections 27 to 32 of the draft regulations with similar provisions applying to other Acts.
- (3) The task force recommends the intent of the functional activities procedures network to enable the three critical reviews to take place as well as comprehensive environmental planning as discussed in the philosophy of this study.
- (4) The task force recommends that Sections 27-32 be waived for operators traditionally producing 8,000 tons per year or less.

COAL MINING EXPLORATION
OPERATION AND RECLAMATION REGULATIONS
under
THE DEPARTMENT OF THE
ENVIRONMENT ACT

1. These regulations may be cited as the "Coal Mining, Exploration, Operation and Reclamation Regulations".
2. In these regulations,
 - (a) "Act" means The Department of The Environment Act;
 - (b) "administrative department" or "administrative agency" means that government department or government agency to which the Minister, in consultation with the Co-ordinating Council, has delegated responsibility in part for the administration of these regulations with the consent of the Lieutenant Governor in Council;
 - (c) "Co-ordinating Council" has the meaning given to it in The Department of The Environment Act;
 - (d) "Department" means the Department of The Environment'
 - (e) "Development and Reclamation Guidelines" means Sections 27 to 32 of these regulations;
 - (f) "Development and Reclamation Review Committee" means an inter-departmental committee appointed by the Minister pursuant to Section 6 of the Act to assess all coal mining applications;
 - (g) "Exploration and Reclamation Review Committee" means an inter-departmental committee appointed by the Minister pursuant to Section 6 of the Act to assess all coal mineral exploration applications;
 - (h) "Mineral Review Committee" means an interdepartmental committee

appointed by the Minister pursuant to Section 6 of the Act
to assess all proposed mineral lease sales and renewals;

(i) "Minister" means the Minister of the Environment.

2. These regulations shall apply to all patented or public lands within Alberta upon which exploration, opening up, operation, reclamation or abandonment of coal mining is intended or underway.

Application for Coal Mineral Leases

3. Prior to the posting of a coal mineral lease sale or the renewal of a coal mineral lease, the proposed area shall be reviewed by the Mineral Review Committee and the advisability of the disposition, having regard to its effect or possible effects on the environment shall be reported to the Minister.
4. Where in the opinion of the Minister irreparable environmental losses of sufficient magnitude may occur, the necessary restriction on powers specified in section 12 of the Act may be exercised.

Application for Exploration and Reclamation

5. (1) Prior to any exploration activities taking place, the operator shall file a detailed exploration and reclamation application with the administrative department or agency.
- (2) The application shall:
- (a) be in the form prescribed by the Minister;
 - (b) be completed in quadruplicate, and
 - (c) be accompanied by an application fee of not less than \$200, plus \$5.00 per acre for each acre to be explored and \$20.00 for each mile of road to be utilized.
- (3) The application shall show at least the following information:
- (a) the full name and address of the applicant;

- (b) a legal description of the land on which the applicant's exploration is to be carried out and his interest in the land;
- (c) a legal description of all other land adjacent to which the applicant is the owner, purchaser or lessee or in which he has an interest, directly or indirectly;
- (d) a description of the applicant's exploration and reclamation plan outlining among other things:
 - (i) the location, nature and extent of all access roads,
 - (ii) the location, nature and extent of all water crossings,
 - (iii) the location, nature and extent of all surface disturbances with respect to all exploration drilling, boring and excavation,
 - (iv) the proposed deposit of all surface material being disturbed,
 - (v) the planned reclamation upon completion of the exploratory work, and
 - (vi) the name and address of the person or corporation responsible for the exploration and reclamation work if not undertaken directly by the applicant.

6. (1) Each application shall be reviewed by the Exploration and Reclamation Review Committee.
- (2) The committee shall obtain any other information considered to be relevant to the application.
- (3) In reviewing an application, the committee shall consider in addition to the statements in the application,

- (a) the general, overall impact of the applicant's proposal on the environment, with specific reference to the Land Conservation Guidelines appended hereto.
 - (b) the past performance of the applicant or the person responsible for the exploration and reclamation work, and
 - (c) the financial ability of the applicant to satisfactorily complete the work being proposed.
- (4) The committee may interview the applicant if it considers it necessary to do so and shall where requested by the applicant.
- (5) The committee, after reviewing the application, shall recommend to the administrative department or agency that the application be rejected or, subject to its recommendation under subsection (6), that it be accepted.
- (6) Where the committee recommends acceptance of the application, it shall also recommend, with its reasons for doing so,
- (a) the terms and conditions of all exploration activities not being inconsistent with other applicable regulations,
 - (b) the terms, conditions and timing of all reclamation activities not being inconsistent with other applicable regulations,
 - (c) the terms of maintaining the reclamation works, including revegetation, for a full year beyond their completion, and
 - (d) the taking of a security deposit in a form satisfactory to the Provincial Treasurer in an amount not less than \$10,000. per application and not exceeding \$100,000 per application unless the scope and complexity of the reclamation is considered to be greater in cost.

7. The administrative department or agency shall accept the recommendation of the committee but in the event of conflict may appeal to the Minister

whose decision shall be final.

8. (1) Upon the satisfactory completion of the exploration and reclamation plan as determined by an inspection carried out by the administrative department or agency, the security deposit or a portion thereof shall be returned to the applicant.
- (2) All or a portion of the security deposit may be withheld where the administrative department or agency
 - (a) is required to expend public funds or facilities to complete the work, or
 - (b) requires additional time to determine the effectiveness of the reclamation.

Application for Development and Reclamation

9. (1) An application for the opening up, operation and reclamation of a coal mine shall be filed with the administrative department or agency,
- (2) The application shall
 - (a) be in the form prescribed by the Minister,
 - (b) be in quadruplicate,
 - (c) be accompanied by an application fee of \$50 for operators, mining less than 8,000 tons/year and \$500. for others.,
 - (d) shall include a development and reclamation plan.
- (3) The application shall show at least the following information:
 - (a) the full name and address of the applicant,
 - (b) a legal description of the land on which the applicant's operation and development is to be carried out and his interest in the land,
 - (c) a legal description of all other lands adjacent to which the applicant is the owner, purchaser or lessee or in which

he has an interest, directly or indirectly,

- (d) the name and address of the person or corporation responsible for the opening up, operation, development and reclamation work if not undertaken directly by the applicant.
- (e) proof of rights to the surface on patented land,
- (f) proof of rights to the minerals,
- (g) proof that the applicant has complied with the requirements of The Industrial Wages Security Act and The Workmans Compensation Act.

10. (1) Each development and reclamation plan shall be prepared and certified by a person considered to be acceptable to the development and reclamation review committee.

- (2) It shall consist of Part A, a predevelopment plan of a general nature to be submitted prior to Part B of a more specific nature and an appendix of maps and names of those responsible for the compilation of the plan.

11. Part A of the development and reclamation plan shall provide

- (1) a general descriptive outline including among other things
 - (a) the estimated location, quality and quantity of the reserves to be developed.
 - (b) the geological stratification showing the depth and type of overburden,
 - (c) the projected thickness, dip and strike of the coal seam,
 - (d) the planned sequential rate of production,
 - (e) the overall duration of the operation,
 - (f) the estimated manpower and housing requirements,
 - (g) the potential impact on the environment,

- (h) the feasibility and cost comparison of the intended type of operation as opposed to sub surface types of operation,
- (i) the projected marketing of the product.

(2) a detailed description of

- (a) the procedures and equipment used to open up the site,
- (b) the proposed location and position of all overburden deposits,
- (c) the procedures and equipment to be used in extraction,
- (d) the location of access and haul roads,
- (e) the procedures and equipment to be used in conveyancing the coal from the mine to the processing installation,
- (f) the location, procedures and equipment to be used in processing the coal,
- (g) the location and nature of any waste deposits from processing,
- (h) the means of transporting the product from the processing plant to the public transporation facility.

(3) a sequential schedule of all activities in opening up, operation, development and reclamation that includes

- (a) the timing for each stage and the sequence of activities,
- (b) the simultaneous interrelationships of operations, development and reclamation,
- (c) the concurrent activities of development and reclamation.

(4) a list of names and qualifications of those persons contributing to Part B of the plan.

12. Part B of the development and reclamation plan shall include all those specific provisions of sections 13 to 21 inclusive.

13. (1) The applicant shall provide details of investigations into the impact of their proposed plan on competing land uses within the same location or in close proximity thereto with regard to the

following among other things,

- (a) residential development,
- (b) aesthetic and scenic considerations,
- (c) active or passive outdoor recreation areas,
- (d) ecological considerations of indigenous flora and especially fauna,
- (e) existing industrial and commercial developments,
- (f) transmission and transportation facilities.
- (g) housing requirements and related services including:
 - (i) sewer
 - (ii) domestic water
 - (iii) electricity
 - (iv) telephone
 - (v) access roads
 - (vi) schools
 - (vii) hospitals.

- (2) Other details required to make a complete assessment depending on the specific nature of the site.

14. (1) The applicant shall provide a surface disturbance report outlining among other things,
- (a) the exact area to be cleared of vegetation,
 - (b) the exact area in which a physical disturbance of the surface or excavation will be made,
 - (c) the exact area in which spoil material will be deposited.
- (2) Where the surface vegetation consists of merchantable timber as determined by the administrative department or agency, it shall be salvaged in a manner prescribed with the avoidance of any unnecessary disturbance or damage to trees reserved from cutting.

(3) The disposal of any timber debris shall be by burning or as directed by the administrative department or agency.

15. The applicant shall provide a materials engineering report giving a stability analysis for the loaded slope and overburden spoil deposits, based on the results of a foundation investigation and the inherent properties of the spoil material.

16. (1) The applicant shall provide a surface water and groundwater management report which shall contain sufficient detail to project water quantity estimates under various flow regimes.

(2) The surface water management report shall include:

(a) all engineering data and design details for all

(i) water flow control structures

(ii) water diversion structures

(iii) drainage structures

(iv) erosion control and watershed protection structures,
and

(v) roads and bridges

(b) information detailing the expected effects of the operation on the natural channel pattern of the area.

(3) Where flood plains are involved, the report shall include

(a) a topographic plan of the site showing flood levels at various frequencies of which one shall be the 50 year frequency,

(b) comments by a competent river engineer on

(i) the probability of channel shifting in the flood plain,

(ii) the danger from ice jam flooding.

(c) the nature of pollutants that could reach the river, stream, or lake under conditions outlined in (3) (a) of this section.

- (4) The groundwater management report shall include
 - (a) a geological report of the area, based on the results of the exploratory drilling and excavation, including elucidation of the stratigraphy, lithology and structure of both overburden and bedrock.
 - (b) a hydrogeological study of the proposed mining area, including
 - (i) mapping of natural groundwater phenomena such as springs, seepage areas, phreatophytic vegetation, salt precipitates
 - (ii) determination of depth to water table, of piezometric water levels, and of water-bearing zones.
 - (c) chemical analysis of groundwater samples obtained during drilling and excavation, and from springs and seepage areas.
 - (d) a groundwater resource evaluation by means of aquifer performance tests (pump tests).
 - (e) groundwater regime parameters, with particular reference to
 - (i) groundwater in storage in the ground
 - (ii) groundwater flow systems
 - (iii) volumes of groundwater discharge
 - (iv) groundwater chemistry.
 - (5) Where important groundwater aquifers are present, an evaluation will be required of the general effect of surface mining on the groundwater regime, both during mining operations and after completion of reclamation.
17. (1) The applicant shall provide a water quality management and pollution control report which shall also satisfy the requirements of The Clean Water Regulations.
- (2) This requirement shall apply to all new proposals for mining or to changes being proposed for existing mines and facilities.

- (3) The description of the operating process with regard to the supply and use of water and subsequent waste disposal shall include:
 - (a) a flow diagram and a written description of the operating process in sufficient detail to indicate:
 - (i) the quantity of water used in a specific process of the operation,
 - (ii) the quantity and measured, or estimated, quality of wastes originating from the use of water or other liquids.
 - (b) where the quantity and/or quality of the wastes varies according to an operating procedure, the variation in rates of flow (normal, maximum and minimum) and the maximum and average concentrations of the significant waste components.
- (4) The description on the design of treatment facilities shall consist of an engineering report on the proposed works and include
 - (a) the expected flow and concentrations of liquid operating wastes,
 - (b) the means of measuring wastes from all processes contributing to the plant's treatment facilities influent,
 - (c) a flow diagram describing the proposed treatment processes,
 - (d) the function, capacity and operation of the individual components comprising the treatment facilities, and the system as a whole with available performance data of each,
 - (e) the quantities of treatment chemicals,
 - (f) the expected degree of reduction in pollutional load to be effected by the system with supporting research on pilot plant data,

- (g) a statement setting forth the expected bacterial, physical, chemical and other known characteristics of the treated effluent,
 - (h) the method of disposal for sludge and other solid or liquid process wastes,
 - (i) engineering drawings including plans and profiles of each unit in the treatment or control system,
 - (j) plans and profiles of outfall sewers at the receiving water.
- (5) The descriptions shall be accompanied by plans showing the physical configuration of the facilities and including
- (a) a general arrangement or sketch of property (to approximate scale) to co-ordinate buildings, treatment or disposal facilities, property boundaries, effluent lines, points of discharge in relation to the receiving water, and municipal or private sanitary sewer connections.
 - (b) drawings or sketches of plant areas in sufficient detail to indicate:
 - (i) size and location of operating process equipment concerned,
 - (ii) location and sizes and direction of flow of collection and transmission sewers including sewers transporting uncontaminated waters entering the treatment or effluent system with existing sewers being differentiated from proposed sewers,
 - (iii) location of all equipment involved in the proposed treatment, control or disposal of wastes with existing equipment being differentiated from proposed equipment.

- (6) In all cases for the field operation, the applicant shall provide information:
- (a) giving a comprehensive review of measures to be established to reduce suspended solids to acceptable levels,
 - (b) detailing the monitoring system for water quality showing locations and methods.
- (7) The release of any waste waters to a watercourse shall be minimized by incorporating existing technology to treat and re-use waste waters resulting from all phases of the mining operations including ponded water collected from local precipitation and wash water from the coal processing plant.
- (8) For purposes of preparing the necessary water quality, management and pollution control report the following effluent water quality standards or those provided by The Clean Water Regulations which ever are the lesser shall apply:
- (a) suspended solids shall not exceed 50 mg./l. with sufficient retention time in settling basins in order that the concentration of suspended solids in the receiving water body is not increased by more than 10 mg./l. over the natural background level,
 - (b) the pH shall not exceed the range of 6.5 to 9.5 with the receiving water body not to be altered by more than 0.5 pH units from the natural background level,
 - (c) total iron content shall not exceed 1.0 mg./l,
 - (d) the secondary treatment providing 90% biochemical oxygen demand (BOD) removal or equivalent of all sanitary waste waters shall be required,
 - (e) settling basins will be required to

- (i) contain localized surface runoff from the immediate mining areas,
 - (ii) control the quality of the effluent discharged into any receiving water body to not exceed the limits specified in subsections (8) (a) to (8) (c) inclusive of this section.
- 18.
 - (1) The applicant shall provide a report specifying the impact of air contamination, especially coal and road dust and noise effects and the proposed methods of control.
 - (2) The standards specified in The Clean Air Regulations shall be adhered to.
- 19. Where, in the opinion of the Department, the proposed actions will lead to irreparable degradation to the environment, he will as directed
 - (1) undertake additional reclamation works to compensate for the loss of the resource especially recreation facilities and ungulate winter rangeland, or
 - (2) undertake adjacent development works to compensate for the loss of the resource especially recreation facilities and ungulate winter rangeland, or
 - (3) if required to do so, provide funds to the Department in order that compensatory or amending action may be undertaken.
- 20.
 - (1) The application shall provide a detailed reclamation plan and program which shall include;
 - (a) the time and sequence schedule to be followed,
 - (b) the physical and biological methods to be used,
 - (c) the final condition and subsequent use of the reclaimed site.
 - (2) Where the applicant proposes to create artificial water impoundments or leave open pits, he shall provide:

- (a) a long term soil stability analysis of the high wall slope based on the results of a foundation investigation,
 - (b) a safety analysis of the open pit.
- (3) Where revegetation is being proposed, the applicant shall provide
- (a) results of chemical analysis of soils to be used for beds in water systems,
 - (b) results of chemical and physical analysis of soils and overburden strata to be used to establish vegetation,
 - (c) types of vegetation to be used and their means of establishment.
 - (d) where reforestation is planned, an indication of the number and type of seedlings which will be required and from where they will be obtained,
 - (e) the scheduling of revegetation and the subsequent nurturing of it in its initial growth stages.
- (4) The applicant shall provide
- (a) plates illustrating completed reclamation for each stage which show all details,
 - (b) an artist's illustration showing the final features after total reclamation.

21. The applicant will provide a map section containing maps and plates required to more clearly illustrate the development and reclamation proposal being submitted.

- (1) Location maps on NTS (1:50,000 - where available) map indicating location of plants, areas of development, lease boundaries, haul roads, and campsites.

- (2) Topographic maps on a scale of 1 inch: 200 feet with suitable contours with a mylar overlay showing
 - (a) details of permanent and temporary development,
 - (b) location of garbage dumps, spoil piles, overburden storage areas, haul roads, residences, workshops, boundaries, pits, plants, and cleared areas.
- (3) Aerial photograph mosaic on a scale of 1 inch: 200 feet upon which the mylar overlay specified in subsection (2) can be overlaid to show
 - (a) major areas of disturbance and developments to be established,
 - (b) the legal subdivision or portions thereof which will be affected.
- (4) Hydrologic diagrams showing drainage patterns as well as
 - (a) all permanent and intermittent water systems, including flood plains, where present,
 - (b) further plates, as are necessary, showing intended diversion schemes, damsites, channel containment schemes, or artificial water routes, and indicating areas to be affected.
- (5) Excavation plates showing
 - (a) mine sections at a scale of 1 inch: 40 feet,
 - (b) the location and configuration of temporary and permanent spoil piles,
 - (c) cross sections of mined areas after reclamation and indicating thereon the original ground level and proposed configuration,
 - (d) typical section(s) from surface coal seam(s) identifying the various strata,
 - (e) design plan of all ditches, roadways, berms or other structures.

22. The applicant shall specify the names of personnel, their business address and telephone number of individual responsible for the preparation of the various reports comprising the development and reclamation plan.

Review of the Development and Reclamation Plan

23. (1) Each application for development or its amendment thereto, shall be reviewed by the Development and Reclamation Review Committee.
- (2) The committee shall obtain any other information considered to be relevant to the application.
- (3) In reviewing an application, the committee shall consider in addition to the statements in the application,
- (a) the general, overall impact of the applicant's proposal on the environment,
 - (b) the past performance of the applicant or the person responsible for the development and reclamation work, and
 - (c) the financial ability of the applicant to satisfactorily complete the work being proposed.
- (4) The committee may interview the applicant if it considers it necessary to do so and shall where requested by the applicant.
- (5) The committee, after reviewing the application, shall recommend to the administrative department or agency that the application be rejected or, subject to its recommendation under subsection (6), that it be accepted.
- (6) The administrative department or agency shall upon receipt of the committee's recommendation and any other relevant information, hold a public hearing on the applicant's proposal.
- (7) Where the committee recommends acceptance of the application, it may also recommend, with its reasons for doing so,

- (a) the terms and conditions of all development and reclamation activities not being inconsistent with other applicable regulations,
- (b) the terms, conditions and timing of all reclamation activities not being inconsistent with other applicable regulations,
- (c) the terms of maintaining the reclamation works, including revegetation, for a full year beyond their completion, or
- (d) the taking of a security deposit in a form satisfactory to the Provincial Treasurer in an amount not less than \$1,000. per disturbed or affected acre per application.

24. The administrative department or agency shall accept the recommendation of the committee but in the event of conflict may appeal to the Minister whose decision shall be final.
25. The Development and Review Committee shall submit its recommendation within ninety (90) days after being provided with the full particulars of the plan.
26. Upon approval and acceptance of the plan, the following permits and licenses shall be issued under separate approval;
- (1) the construction of service facilities and campsites,
 - (2) any operation which affects the natural hydrologic operations of the area,
 - (3) all facilities and operations involving waste treatment and its disposal,
 - (4) surface lease on public land,
 - (5) mining permits.

Development and Reclamation Plan Guidelines

27. (1) The responsibility of ensuring that environmental degradation does not occur is placed on the applicant.

- (2) Sections 27 to 32 inclusive specify those guidelines by which (among others) the Development and Reclamation Review Committee shall assess all applications.

28. Reclamation activities shall be guided by the following:

- (1) Reclamation shall be conducted in accordance with the development and reclamation plan submitted to the administrative department or agency for approval, and the operating conditions of the lease contract.
- (2) Suitable overburden material shall be piled separately to be used as a top layer in completing the reclamation program.
- (3) The reclaimed area shall be contoured in order that the disturbed areas blend in with the natural topography.
- (4) At the completion of coal extraction in the individual pits and in portions of individual pits, the strip mine pits shall be progressively backfilled with overburden material from the proposed new or from the present strip mine pit and revegetated as soon as possible thereafter.

29. Water management shall require the following:

- (1) Sedimentation ponds shall be required and it may be necessary to have the sedimentation ponds operative until revegetation has been satisfactorily accomplished.
- (2) All necessary precautions shall be taken to prevent soil erosion and the siltation of water bodies. This requires the proper backsloping of all cuts and fills, provision of adequate drainage facilities, the construction of berms, and the establishment of a suitable vegetation cover on all disturbed areas immediately after work is completed.

- (3) All spoil and mine areas shall be properly ditched to ensure that surface drainage is diverted around the spoil area. Drainage ditches are to be treated to prevent washing, soil erosion, and siltation.
- (4) All dams, stream crossing structures, stream diversions, sedimentation ponds and settling basins must be approved prior to any clearing or construction taking place.
- (5) All timber and debris shall be removed from water reservoirs, sedimentation ponds, and settling basins prior to their construction and use.
- (6) All necessary precautions shall be taken to prevent pollution of existing streams by deleterious materials from disturbed lands, spoil areas, coal waste piles and campsites.

30. Spoil piles management shall require the following:

- (1) Temporary spoil piles shall not be permitted in a location which would result in siltation of any drainage course.
- (2) Placement of spoil will not be allowed on any slope gradient exceeding 25 degrees unless proven feasible by the foundation study.
- (3) The acceptable slopes will be determined on the basis of existing topography and materials.
- (4) Slopes to be vegetated on a spoil pile shall not exceed a final slope of 27 degrees (2:1).
- (5) When spoil piles are located near streams, the toe of the spoil pile should not be located closer than 300 feet to the highwater mark of the watercourse, unless authorized otherwise.
- (6) The entire pit area should be backfilled where feasible.
- (7) Spoil piles located in the headwaters of drainages are to be

enclosed in a containing berm and the spoil material placed in such a manner so as to insure that spoil does not extend above the inside base of the berm. All spoil material must be contained within the berm.

- (8) All spoil pile areas are to be tested for stability of material by the company and the results provided to the administrative department or agency prior to any placement of overburden on these areas. Stability of the spoil must be assured by the applicant and no placement of spoil will be allowed on areas judged to be unstable or where unstable conditions may be generated.

31. Limits for clearing and operations are specified as follows:

- (1) Land clearing around the perimeter of spoil piles and the mining operation shall not exceed fifty (50) feet in width unless authorized otherwise.
- (2) The boundaries of all areas to be utilized for mining, spoil areas, and other disturbances are to be permanently marked on the ground to allow for the evaluation of mining operation.

32. Haulroads

- (1) Where roadways parallel water courses, there should be a minimum protection strip of undisturbed vegetation between the roadway clearing and the highwater mark of the watercourse, as is specified in the Land Conservation Guidelines.
- (2) All road crossings, of water courses should be kept to a minimum and should be at right angles. Upstream and downstream movement of fish should not be impeded.
- (3) No road construction will be permitted on major flood plains unless an alternate route is not available. In those cases

maximum erosion control must be exercised.

- (4) No litter debris accumulations will be allowed.
- (5) All roads shall be properly drained by use of culverts, dips, outsloping so as to prevent erosion of the disturbed areas. Peak flows are to be accommodated.
- (6) Revegetation of the roadside should take place immediately upon completion with a seeding program and complete reclamation to take place upon abandonment of the road.
- (7) Road dust shall be kept at a minimum of spraying access roads with water or other approved compounds.

Inspection and Reporting Responsibilities

- 33. Upon the execution of an approval the Minister will designate the environmental inspection and regulatory administrative department or agency.
- 34. The approved applicant shall provide the administrative department or agency with periodic monitoring results and certified reports;
 - (1) The quantity of waste water effluent measured in gallons per day reported by an appropriate weir installation or metering device.
 - (a) a twenty-four (24) hour composite sample shall be collected once per week at regular intervals and analyzed for suspended solids, pH, total iron, and additional analysis as required.
 - (b) monthly results of the analyses shall be forwarded to the department not later than the end of the following month for which the data were collected.
 - (c) an annual report describing the general efficiency and alterations of all waste water treatment facilities shall be provided.

(2) An annual report at the end of each calendar year shall give the following details of the past year's operations;

(a) a current air photo mosaic at a scale of 1 inch: 600 feet showing the total operation,

(b) a written report showing details of

(i) timber salvage,

(ii) clearing operations

(iii) new pits opened up

(iv) spoil deposit areas

(v) sedimentation ponds or settling basins

(vi) roads and power lines

(vii) reservoirs and water diversions

(viii) buildings constructed

(ix) status of reclamation progress.

(c) photographs shall be used to supplement written reports.

(3) All reports are to be certified by a professional responsible for the operations.

35. (1) Upon the satisfactory completion of the development and reclamation plan as determined by an inspection carried out by the administrative department or agency, the security deposit or a portion thereof shall be returned to the applicant.

(2) All or a portion of the security deposit may be withheld where the administrative department or agency

(a) is required to expend public funds or facilities to complete the work, or

(b) requires additional time to determine the effectiveness of the reclamation.

36. In the event of abandonment of the development and reclamation plan by the approved applicant as a result of his withdrawal from the lease agreement the security deposit shall be forfeited to the Crown.
- (1) The administrative department or agency shall attempt to arrange for the completion of the plan with other applicants.
 - (2) Failing to do so, it shall proceed with the necessary reclamation pursuant to the plan.
 - (3) The public funds so expended shall be compensated by the security deposit deposited with the plans approval.
 - (4) Those costs expended by the Provincial Treasurer under subsection (3) in excess of the security deposit shall be invoiced to the approved applicant as the costs constitute a debt payable to the Crown by that approved applicant.

APPENDIX 1

LAND CONSERVATION GUIDELINES

1. (1) In this section and sections 2 to 22,
 - (a) "land" means the land held by the landholder as registered owner, purchaser, homestead purchaser or homestead lessee, and on any part of which a land development project is or is to be carried out; and land contained within the boundaries of an active forest management agreement, a timber licence or timber permit.
 - (b) "water body" means the bed and shore of a lake, pond, marsh, slough or other permanent body of water but does not include a watercourse or surface water;
 - (c) "watercourse" means the bed, shore, and banks of a river, stream, creek or other watercourse whether the flow of water therein is continuous or intermittent.
 - (d) "inspector" includes any authorized employee of the Government of Alberta, including land inspectors, forest officers, agricultural inspectors and wildlife officers.
 - (2) Where doubt arises in determining distances from a watercourse or water body for the purpose of sections 4 to 6 by reason of the difficulty in determining the boundary of the bed, shore, or banks of a watercourse or water body, the distance shall be measured from the existing high water mark of the watercourse or water body.
2. Where the land
 - (a) has slopes greater than 5 per cent and longer than 1,320 feet, or

(b) in the opinion of an inspector, would be subject to soil erosion from wind or water action if it were used for cereal crop or row crop production, or

(c) in the opinion of an inspector would be subject to soil erosion from wind or water action if the timber growing thereon were completely removed,

the land involved in the land development project shall be protected by leaving undisturbed and undeveloped native vegetation in the form of contour shelterbelts or reserve stands or timber in such locations and of such width (not less than 100 feet) as the inspector determines, but if, in the inspector's opinion, the native vegetation in those shelterbelt or reserve stand locations is insufficient to provide protection from erosion, the inspector may require the planting of trees or grass, or partly trees and partly grass, in those shelterbelt locations, or may prescribe such alternate erosion control measures as are practicable under the circumstances.

3. (1) Subject to section 3 (4), where the land contains a coulee or a valley break, the landholder shall not develop or disturb that part of the land that lies within

(a) 75 feet of the upper break of the coulee or valley where the average depth of the coulee or the valley break is less than 50 feet, or

(b) 150 feet of the upper break of the coulee or valley where the average depth of the coulee or the valley break is at least 50 feet and not more than 100 feet, or

(c) 200 to 1,320 feet of the upper break of the coulee or valley (whatever distance the inspector prescribes) where the average

depth of the coulee or the valley break is more than 100 feet and the slope faces generally in a northerly or easterly direction, or

- (d) 200 to 2,640 feet of the upper break of the coulee or valley (whatever distance the inspector prescribes) where the average depth of the coulee or the valley break is more than 100 feet and the slope faces generally in a southerly or westerly direction.

- (2) An inspector may vary any of the requirements of subsection (1) in any particular case where in his opinion it is reasonable to do so having regard to the ecological or other physical conditions existing on the land.

- (3) In this section, "coulee" includes gully, ravine or any similar topographical feature.

- (4) Notwithstanding the above, merchantable timber may be harvested from within the limits prescribed by this section subject to the conditions set forth in section 4 and provided special considerations to safeguard the site are included in annual operating plans for the approval of an inspector.

- 4. (1) Where the land contains a watercourse, the landholder shall not develop or disturb that part of the land that lies within

- (a) such distance (not greater than 100 feet) as the inspector prescribes, where the average width of the watercourse is less than 10 feet, or

- (b) 100 feet on either side of the watercourse, where the average width of the watercourse is at least 10 feet and less than 50 feet, or

- (c) 150 feet on either side of the watercourse, where the average width of the watercourse is at least 50 feet and not more than 200 feet, or
 - (d) 200 feet on either side of the watercourse, where the average width of the watercourse is more than 200 feet.
 - (2) An inspector may vary any of the requirements of subsection (1) where in his opinion it is reasonable to do so provided the capability and quality of the watercourse will not be reduced or impaired in any way.
5. (1) Where the land borders on a water body or contains a water body within its boundaries and that water body is classified as having a waterfowl wildlife capability of class 4 or better or a water capability for sport fish of class 4 or better, the landholder shall not develop or disturb that part of the land that lies
- (a) within 100 feet of the water body, where the area of the whole water body is less than 10 acres, or
 - (b) within 200 feet of the water body, where the area of the whole water body is at least 10 acres and less than 40 acres, or
 - (c) within 300 feet of the water body, where the area of the whole water body is 40 acres or more.
- (2) Where the land borders on a water body or contains a water body within its boundaries and that water body is classified as having a waterfowl wildlife capability or water capability for sport fish of class 5, 6, or 7, the landowner shall not develop or disturb that part of the land that lies
- (a) within 100 feet of the water body, where the area of the whole water body is 40 acres or more, or

(b) within such greater or lesser distance as the inspector prescribes, in any other case.

6. (1) Where the land borders on a water body or contains a water body within its boundaries, the landholder shall not develop or disturb that part of the land that lies
- (a) within 400 feet of the water body, where the outdoor recreation capability of that water body is class 4 or better, or
 - (b) where the outdoor recreation capability of that water body is class 5, 6, or 7, within such distance of the water body as the inspector prescribes, which shall be less than 400 feet but not less than any distance that applies under section 5.
- (2) Where clause (a) of subsection (1) applies to the land, section 5 does not apply to that land.

7. Stream or Watercourse Reserves - Each watercourse shall be classified into one of three categories: main, secondary and other. Main and secondary watercourses shall be classified on a watercourse map. The three classes and reserve timber requirements for each are as follows:

- (1) Main watercourses - major streams and rivers as designated on the watercourse map. Requirements:
 - (a) No roads, landings or bared areas to be located within 330 feet of the high water mark without the written approval of the inspector.
 - (b) No disturbance of any kind and no removal of forest cover, within 200 feet of the high water mark except where specifically approved in writing following inspection by an inspector.

- (c) Where removal of forest cover within 200 feet is approved, no skidder, scarifier or other machine to operate within 66 feet of the high water mark. Timber in the 66 foot area to be removed by winching or other means such that the machine will remain outside the 66 foot strip,
 - (d) Any trees felled within the 200 foot area are to be felled away from the watercourse, and no debris of any kind to be allowed to enter the watercourse. Any debris or trees which accidentally or inadvertently enter the watercourse shall be immediately and completely removed (using winches) without the machine entering the watercourse.
- (2) Secondary watercourses - small but permanent streams as designated on the watercourse map, in two colors, one denoting areas of steep terrain and one denoting areas of gentle terrain. These color designations will serve for general planning purposes and for allowable cut calculation. In practice, gentle terrain will be defined for each location as it exists in the field. Grades of 25 per cent and less will be defined as gentle. Requirements:
- (a) No roads, landings or bared areas within 330 feet of the high water mark without the written approval of the inspector.
 - (b) No disturbance of any kind, and no removal of forest cover, within 100 feet of the high water mark except in areas of gentle terrain where neither bank is strongly sloped, where removal may be allowed up to the high water mark following inspection and approval in writing by an inspector.

- (c) Where removal of forest cover within 100 feet is approved in areas of gentle terrain, no skidder, scarifier or other machine to operate within 66 feet of the high water mark. Timber to be removed from the 66 foot area by winching or other means such that the machine will remain outside the 66 foot strip.
 - (d) Any trees felled within the 100 foot area are to be felled away from the watercourse unless otherwise approved in writing by an inspector, and no debris or slash to enter the watercourse. Any debris or trees which accidentally or inadvertently enter the watercourse shall be immediately and completely removed (using winches) without the machine entering the watercourse.
- (3) Other watercourses - generally definable only on the ground, not designated on the watercourse map.

The Government will request and discuss with the company any special treatment required regarding pertinent portions of other watercourses in any operating area prior to the approval of any annual operating plan or intermediate road or cutting plan submissions. The Government's proposals will be delineated for special safeguard by the company after mutual agreement.

- (a) Wherever feasible, the company will not construct roads within such watercourses.
- (b) Where road construction is required across or along such watercourses, all obstructions must be removed after post-logging treatment and erosion control measures will be implemented during construction and use in accordance with

any road construction standards which may be officially established for the agreement area.

8. Lakes - The Government will classify lakes with regard to their recreational, waterfowl, sport fishing potential and advise the company of the classification. Three general classifications will be recognized:

- (1) Lakes and water bodies with little or no recreational, waterfowl, and sport fishing potential. Around these lakes no roads, landings or bared areas will be located within 330 feet of the high water mark. On lakes exceeding 40 acres in area no roads, landings or bared areas will be located within 200 feet of the high water mark, except after inspection and approval by an officer of the Government. If removal of timber is approved, no machinery is to operate within 66 feet of the high water mark, trees are to be felled away from the water and no debris is to enter the water body.
- (2) Lakes and water bodies with waterfowl and sport fishing potential equivalent to or in excess of Canada Land Inventory Class 1, 2, 3 or 4. Around these lakes no roads, landings or bared areas will be located within 330 feet of the high water mark. On lakes exceeding 10 acres in area there will be no timber removal or disturbance of any kind within 200 feet of the high water mark, except after inspection and approval by an officer of the Government. If such removal is approved, no machinery is to operate within 66 feet of the high water mark, trees are to be felled away from the water and no debris is to enter the water body.
- (3) Lakes and water bodies with recreational potential. The Government will identify such lakes, and advise the company of them, probably on maps. The Government will delineate the area to be reserved

on the ground and on appropriate maps. Any timber removed from reserved areas will be removed by the Government, and the company will have first refusal at current pulpwood prices to acquire the wood removed. Such reserved areas may be formally deleted from the agreement area at the request of the company.

9. Highways - Timber in cut areas located along highways will be treated in the same manner as timber in other cut areas, except that the company will undertake to fell snags, and undertake prompt scarification or other reforestation treatment with a view to avoiding any unsightly accumulation of slash or debris.

10. Road Standards.

(1) Location

(a) Gradient - Grades shall be kept to a minimum wherever possible, but where steep grades are encountered special control measures may be required.

(b) Reserves along Watercourses and Lakes - Refer to Section I and II.

(c) Major Flood Plains - Wherever road construction is proposed on a flood plain, the Government and the company will mutually determine whether or not an alternative route is available. When it is agreed that an alternative route is not available, construction employing maximum erosion control will be allowed. At any time after construction has been completed, should any problems occur in the way of damage to the watercourse caused by company negligence in building

or maintaining the road, the company must take immediate action towards rectification.

(2) Construction and Maintenance.

Depending on the type of operation, Construction and Maintenance standards will be set for timber extraction roads, with a view towards:

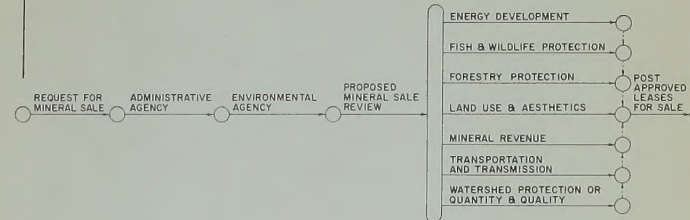
- (a) Minimizing bared soil areas.
- (b) Preventing stream silt.
- (c) Preventing hazardous accumulation of woody debris.

Standards and time intervals will be established for the revegetation of bared areas.

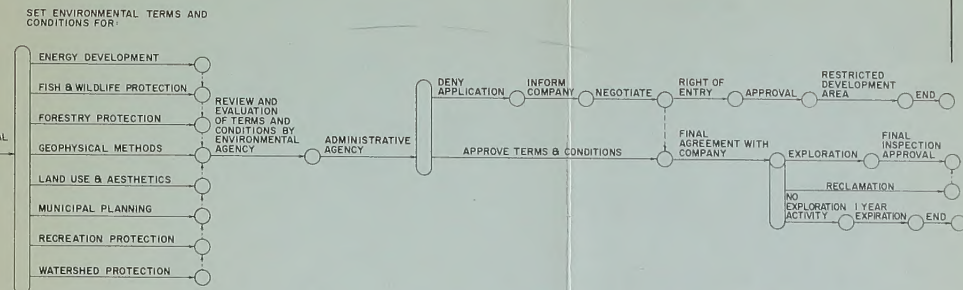
Once standards are established and approved by forest service for an operation, the inspector will require the company to comply.

11. Where the land borders on a watercourse or water body or contains a watercourse or water body within its boundaries, and the inspector is satisfied that the grazing of domestic livestock near that watercourse or waterbody is causing or is likely to cause soil erosion, bank deterioration or water sedimentation of a serious nature, the landholder shall construct and maintain at such places on his land as the inspector may prescribe, any fences or other structure required by the inspector and which are necessary for the purpose of preventing or alleviating such soil erosion, bank deterioration or water sedimentation.

LEASE SALES



EXPLORATION



DEVELOPMENT

